

USSR

UDC 535.215

ZHOLKEVICH, G. A., BERSENEV, B. V., Vologda Pedagogical Institute

"Optical and Electrical Switching of Shadow Conductivity and Photoconductivity of ZnS Films at 77°K"

Tomsk, Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, No. 3, 1972, pp 116-119

Abstract: Measurements of shadow-stimulated conductivity and photoconductivity as the light sum of the excitation by admixture or natural light increases are presented. It is noted that polycrystalline ZnS films sublimated with copper and chlorine admixtures have many properties which are determined by the macroscopic characteristics of their crystalline structures and by the corresponding distribution of the admixture. At temperatures below 200°K new properties arise, primarily the capacity to switch to a state of considerably higher (stimulated) conductivity under excitation by light or electrical voltage. Switching to stimulated shadow conductivity is accompanied by many other film properties: the degree of electrical luminescence increases by an order of magnitude, the thermal

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ZHOLKEVICH, G. A., BERSENEV, B. V., *Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika*, No. 3, 1972, pp 116-119

energy of activation of conductivity becomes very small, and stable filling of traps by excited charge carriers occurs. This experiment shows that the transition to the stimulated state occurs only during the exciting action of the light or field. If this action ceases, a stable state of partial stimulation is obtained. By thus increasing the sum of the excitations supplied, one comes to saturation of the stimulated conductivity, or to total stimulation. The magnitudes of the photocurrents corresponding to the intermediate values obtained for the stimulated thermal currents were established for each new portion of illumination by light of constant intensity.

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UDC: 612.014.421.8:621.317.727.1

BERSENEV, M. S., LUKOSHIKOVA, Ye. V., and KHAYUTIN, V. M., Laboratory of Blood Circulation Regulation and Biophysics Institute of Normal and Pathological Physiology, USSR Academy of Medical Sciences, and Laboratory of Automated Systems for Diagnosis of the All-Union Scientific Research Institute of Medical Instrument Building Ministry of the Medical Industry, USSR, Moscow

"Using the Potentialoscope to Detect Weak Bioelectrical Signals by the Coherent Storage Method"

Moscow, Byulleten' eksperimental'noy biologii i meditsiny, No 8, 1972, pp 115-117

Translation:

A device used for detecting bioelectrical signals in noise of biological and instrumental origin, operating on the principle of coherent storage, is described. A cathode-ray tube with charge storage (the potentialoscope LN-8) is used as the memory device.

At the present time, specialized digital computers (SDC) such as the CAT-400, ART-1000, ATAC-20, ANOPS-1, and "Neuron" are used in the analysis of bioelectrical signals. One of the problems these machines solve best is the detection of weak bioelectrical signals and the averaging of the evoked responses by the

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BERSENEV, M. S., et al., Byulleten' eksperimental'noy biologii i meditsiny, No 8, 1972, pp 115-117

method of coherent storage /3/. However, the widespread use of SDC is limited due to their complexity and high cost. This, in turn, hinders the use of the SDC directly in the course of the experimentation and, consequently, in the determination of further experimental tactics in accordance with the results.

In this connection, it has become urgent to develop small analog analyzers for direct use during experiments. The special cathode-ray tube, the potentialoscope, may be used for this purpose /4/. This tube is capable of holding information for a long time and can therefore be used as an operative storage device.

The potentialoscope consists of a system of electrodes designed to form an electron beam and control its scanning over a signal plate covered by a fine dielectric layer (the target) and a barrier grid. If a varying potential is applied to the signal plate while the electron beam is simultaneously scanned, the potential at each point of the target is determined by the signal plate potential at the moment the electron beam passes through

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BERSENEV, M. S., et al., Byulleten' eksperimental'noy biologii i meditsiny, No 8, 1972, pp 115-117

that point. As a result, a so-called potential relief, capable of being stored for a long time, is formed on the target /5/. The barrier grid reduces interaction of adjoining sections of the target and thus prevents blurring of the potential relief.

The LN-8 potentialoscope is used in the instrument we developed. Research /2/ has shown that, when properly operated, the LN-8 provides a linear relationship between the recorded and input signals with changes in the recorded signal amplitude of 10 to 60 V. This characteristic makes possible an undistorted reproduction of the amplitude characteristics of the signal to be investigated within broad limits.

The functional block diagram of the instrument is shown in Fig. 1. Potentials derived from the nerves, brain, or muscles, pass through the recording amplifier, and are applied to the signal plate of the potentialoscope. The travel of the electron beam along the horizontal is realized by a scanning block in synchronism with the stimulator pulse applied to the object of the investigation. The responses to a single stimulus are arranged along each line. After the line is scanned, the beam reads across the

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BERSENEV, M. S., et al., Byulleten' eksperimental'noy biologii i meditsiny, No 8, 1972, pp 115-117

next line. In accord with the coherence condition, the responses in the lines are arranged one underneath the other, and a potential relief is formed on the target which represents a function of three variables: the biopotential amplitudes (the potential of a given point on the target, the Z axis); the time from the moment of the stimulus (the X axis); the number of the line (the Y axis). For the readings, a sinusoidal voltage (the reading voltage) whose frequency exceeds the band pass of the reading amplifier is applied to the vertical deflecting plates of the potentialoscope. The electron beam, spread by this varying voltage in the vertical direction over the whole target, passes once over the target in the direction of the time axis with a velocity equal to the scanning velocity in recording. With a sufficiently high reading voltage frequency, the electron beam will pass relatively quickly over the target in the transverse direction, successively producing in each discrete vertical line the algebraic sum of the potentials in the lines /1/. Thus, the statistically probable  
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BERSENEV, M. S., et al., Byulleten' eksperimental'noy biologii i meditsiny, No 8, 1972, pp 115-117

bioelectric signals are realized in the reading at the load resistance in the form of the averaged response, fixed by an oscillograph with photographic recording. As a random process, the noise is converted at the output of the instrument into a null or the d-c component of the output signal, depending on its distribution law.

Figure 2 shows the composite potential of the C fiber action obtained from the intact (no fibers removed) cord of the tibial nerve, recorded directly after the amplifier (Fig. 2A), and after averaging 150 responses by the potentialoscope (Fig. 2B). In recording A, the original signal/noise ratio may be approximated at 1:3, while in recording B, after averaging, it is 4:1. As a result of the averaging, then, the signal/noise ratio increases 12 times. The obtained experimental data confirms that the increase in the signal/noise ratio by using this instrument is subject to the  $\sqrt{n}$  law, where  $n$  is the number of averaged responses. If weaker signals are to be detected, the number of averaged responses may be increased by increasing the memory capacity of the instrument with two or more potentialoscopes.

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BERSENEV, M. S., et al., Byulleten' eksperimental'noy biologii i meditsiny, No 8, 1972, pp 115-117

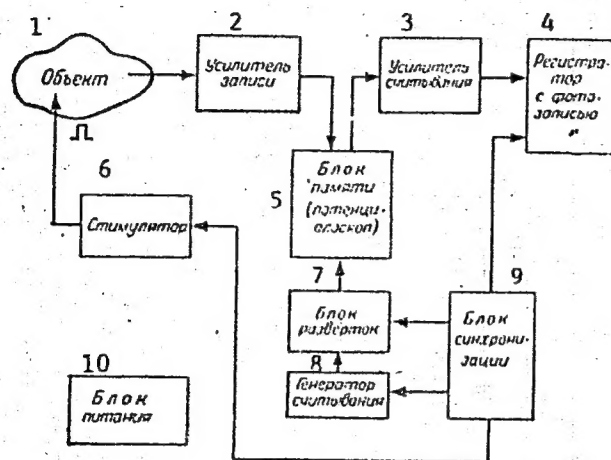


Fig. 1. Functional Block Diagram of the Instrument;

Explanation given in the text.

(Key: 1) Object; 2) Recording amplifier; 3) Reading amplifier; 4) Recorder, with photographic recording; 5) Memory block (potentialoscope); 6) Stimulator; 7) Scanning block; 8) Reading Oscillator; 9) Synchronism block; 10) Power supply)

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BERSENEV, M. S., et al., Byulleten' eksperimental'noy biologii i meditsiny,  
No 8, 1972, pp 115-117

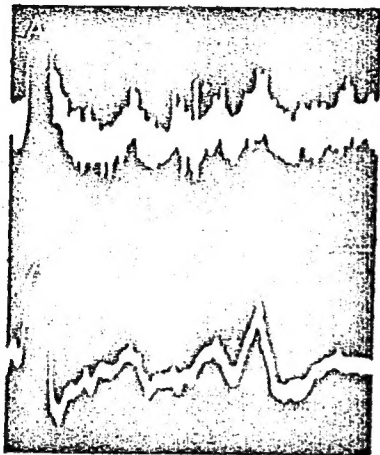


Fig. 2. Composite Potential of the  
Action of Slowly Conducting  
Fibers of a Cat's Tibial Nerve  
Before (A) and After (B) Aver-  
aging.

The distance between the stimu-  
lating and outlet electrodes is  
82 mm. The calibration is 5  $\mu$ V  
(for A), 20  $\mu$ s (for A and B).

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BERSENEV, M. S., et al., Byulleten' eksperimental'noy biologii i meditsiny, No 8, 1972, pp 115-117

BIBLIOGRAPHY

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2. Bersenev, M. S. and Gundarov, V. P., Novosti med. priborostroyeniya (Medical Instrument Design News) Moscow, No 2, 1971, p 34.
3. Kozhevnikov, V. A. and Mershcherskiy, R. M., Sovremennyye metody analiza elektroentsefalogrammy (Modern Methods of Electroencephalogram Analysis) Moscow, 1963.
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5. Khol', M. and Keyzan, B., Elektronoluchevyye trubki s nakopleniyem zaryadov (Charge-Storing Cathode Ray Tubes) Moscow-Leningrad, 1955.

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US 3R

UDC 669.721.046.4

MAURITS, A. A., MEDEUOV, Ch. K., BERSENEV, P. D.

"Tensometric Study of Ammonium Carnallite"

Tr. Vses. N-i. Proyechn. In-ta. Alyumin., Magn. i Elektroden. Prom-sti [Works of All-Union Scientific Research and Planning Institute of the Aluminum, Magnesium and Electrode Industry], 1970, No. 72, pp. 84-89. (Translated from Referativnyy Zhurnal Metallurgiya, No. 5, 1971, Abstract No. 5 G191 by the authors).

Translation: Experimental results are presented from determinations of the vapor pressure over ammonium carnallite crystal hydrates and its anhydrous complex as a function of temperature. The thermal effects of the processes of dehydration and decomposition of carnallite are calculated on the basis of the data produced by a statistical method, using the isobar equations of the chemical reactions. The dependence of the equilibrium constant of dissociation of anhydrous carnallite on temperature is determined. 4 figs; 1 table, 9 biblio refs.

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USSR

UDC 51

BERSENEV, V. L.

"On a Class of Problems in the Optimization of a Homogeneous Engineering System"

Sb. tr. In-t mat. Sib. otd. AN SSSR (Collection of Works. Institute of Mathematics of the Siberian Department of the Academy of Sciences USSR), 1971, No. 9, pp 65-74 (from RZh-Matematika, No 11, Nov 72, Abstract No 11V426)

Translation: The author defines a homogeneous engineering system as a system of devices having the same functional purpose and differing only in the value of the basic parameter. It is proposed that certain forms of work be assigned which can be fulfilled by different devices with corresponding expenditures, so that the participation of devices in fulfilling the work involves certain initial expenditures (for example, on experimental and design development). The problem of optimization of the parameters of a homogeneous engineering system consists in selecting a system of devices and values for its parameters such that in fulfilling the total volume of work the sum of the initial expenditures and costs of application are a minimum. A formal formulation of the problem is given.

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USSR

UDC: 51

PERSENEV, V. L.

"One Class of Optimization Problems of a Homogeneous Technical System"

Sb. Tr. In-t Mat. Sib. Otd. AN SSSR [Collected Works of Mathematics Institute, Siberian Affiliate, Academy of Sciences, USSR], 1971, No 9, pp 65-74 (Translated from Referativnyy Zhurnal Kibernetika, No 11, 1972, Abstract No 11V426, by Yu. Finkel'shteyn)

Translation: The author uses the term homogeneous technical system to refer to a system of devices having identical functional purpose and differing only in the values of their basic parameters. It is assumed that several types of operations are fixed, which can be performed by various devices with corresponding delays, the participation of devices in performance of work involving certain initial expenditures (for example, experimental and design development).

The task of optimization of parameters of a homogeneous technical system consists in the selection of a system of devices and values of parameters such that when the total volume of work is performed the sum of initial expenditures and application costs is minimal. The formal statement of the problem is as follows. Suppose there is a finite set  $X$ , the elements of which are the real numbers. The (non-negative) demand function  $\phi(x)$  is fixed in  $X$ . Requirements  $\phi(x)$  can be satisfied by a certain set of devices with values of parameters

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UDC: 51

Bersenev, V. L., Sb. Tr. In-t Mat. Sib. Otd. AN SSSR, 1971, No 9, pp 65-74

from the finite set  $U$ . The function  $g^0(u)$ , the pay for participation of a device with fixed value of parameter in the process of satisfaction of a demand, is defined in set  $U$ . The real function  $g(u, x)$ , the cost of use of a device with parameter value  $u$  to satisfy a single demand in  $x$  element  $X$ , is fixed in

Sequence  $\{u_i\}_{i=1}^m$  of elements of set  $U$  is called the set which defines the system of homogeneous technical devices, if the devices with values of perimeter  $U_i$ ,  $i=1, \dots, m$  and only these devices participate in satisfaction of the demands. Function  $G(\{u_i\}_1^m, x)$ , the least cost of satisfying a single demand at point  $x$  by set  $\{u_i\}_1^m$ , is studied in  $X$  for any set  $\{u_i\}_1^m$  defining a system. For a fixed set  $\{u_i\}_1^m$ , the summary expenditures related to full satisfaction of the demand are

$$\sum_{i=1}^m g^0(u_i) + \sum_{x \in X} G(\{u_i\}_1^m, x) \tau(x).$$

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Bersenev, V. L., Sb. Tr. In-t Mat. Sib. Otd. AN SSSR, 1971, No 9, pp 65-64

Thus, the task of optimization of the parameters of the homogeneous technical system can be written as follows:

$$\min_{m>0} \min_{\{u_i\}_1^m} \left\{ \sum_{i=1}^m g^i(u_i) + \sum_{x \in X} G(\{u_i\}_1^m, x) \varphi(x) \right\},$$

where  $u_i \in U$ ,  $i=1, \dots, m$ .

It is assumed that function  $g(u, x)$  is quasiconvex with respect to  $u$ . The use of this property allows the solution of the initial problem to be reduced to the task of minimization of a certain polynomial of a special form (called right) with boolean variables. An algorithm in the spirit of pseudoboolean programming is then suggested for the problem of minimization of the right polynomial (for example, see RZhMat, 1968, 12V498). Estimates are presented for the difficulty of calculation using the algorithm for construction of the right polynomial and its minimization.

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1/2 037

UNCLASSIFIED

PROCESSING DATE--23OCT70

TITLE--INVESTIGATION OF THE ANTIFERROMAGNETISM FERROMAGNETISM TRANSITION  
IN THE COMPOUND MN SUB1,88 CR SUB0,12 SB -U-

AUTHOR--(05)--GRAZHDANKINA, N.P., BURKHANOV, A.M., BERSENEV, YU.S.,  
ZAYNULLINA, R.I., MATVEYEV, G.A.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,  
NR 4, PP 1178-1185

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS, MATERIALS

TOPIC TAGS--MAGNETIC TRANSFORMATION, TRANSITION TEMPERATURE, FERROMAGNETIC  
MATERIAL, ANTIFERROMAGNETIC MATERIAL, STRONG MAGNETIC FIELD, HIGH  
PRESSURE EFFECT, CRYSTAL ORIENTATION, CRYSTAL DEFORMATION, ANTIMONIDE,  
MANGANESE COMPOUND, CHROMIUM COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/1502

STEP NO--UR/0056/70/058/004/1178/1185

CIRC ACCESSION NO--AP0106258

UNCLASSIFIED



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UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0106258

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF HIGH PRESSURE (UP TO P EQUALS 11000 ATM.) AND A STRONG MAGNETIC FIELD (UP TO 300 KOE) ON THE ANTIFERROMAGNETISM FERROMAGNETISM TRANSITION TEMPERATURE T OF THE MN SUB1,89 CR SUB0,12 SB COMPOUND IS INVESTIGATED AND THE VALUES OF DT SUBS-OP AND DT SUBS-OH ARE DETERMINED. THE MEASUREMENTS ARE PERFORMED WITH SINGLE CRYSTAL SAMPLES. THE ELASTIC PROPERTIES OF THE COMPOUND ARE INVESTIGATED AND DILATOMETRIC MEASUREMENTS IN VARIOUS CRYSTALLOGRAPHIC DIRECTIONS ARE CARRIED OUT. THE RESULTS OBTAINED ARE DISCUSSED IN LIGHT OF THE KITTEL EXCHANGE INVERSION THEORY OF MAGNETIC PHASE TRANSITION OF THE FIRST KIND.

FACILITY: INST. FIZIKI METALLOV AN SSSR.

UNCLASSIFIED

USSR

UDC 539.4:536.453

BERSENEVA, F. N., SURKOV, YU. P., SOKOLOV, YE. N.

"Investigation of the Thermal Stability of the Structural State of EI-437B Alloy Subjected to High-Speed and Slow Plastic Deformation Under High-Temperature Mechanical Working"

V sb. Vysokoskorostn. deformatsiya (High Speed Deformation -- Collection of Works), Moscow, "Nauka", 1971, pp 115-118 (from RZh-Mekhanika, No 3, Mar 72, Abstract No 3V1532)

Translation: Ingots of the alloy EI-437B were subjected to deformation under 10% deposition at 1080° at rates of 10.1 and 0.001 sec<sup>-1</sup>. The structures of the samples in the initial state and also after heating at 1080° were studied by metallographic and rentgenographic means. It was shown that the structure obtained as a result of high-speed deformation is considerably different from the structure formed during slow deformation. Differences in the structure imparted by preliminary deformation are held persistently and disappear only upon the completion of recrystallization. Authors abstract.

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USSR

UDC 539.374

SURKOV, Yu. P., BERSENEVA, F. N., and SOKOLKOV, Ye. N., Institute of Metal Physics, Academy of Sciences USSR

"Thermal Stability of the Structure of E1437B Alloy After High-Temperature Heat and Mechanical Treatment at Various Deformation Rates"

Moscow, Fizika Metallov i Metallovedeniye, Vol 30, No 5, 1970, pp 963-966

Abstract: Changes in the structure of specimens of E1437B alloy deformed by 10% at 1080° at 10, 1, and 0.001 sec<sup>-1</sup> with subsequent heating were studied. The structure of specimens subjected to high-speed deformation (1 and 10 sec<sup>-1</sup>) was characterized by more incomplete processes of fragmentation, the presence of a large number of dislocations ordered along slipping planes, and a high level of distortion of the material. The behavior of the structures during subsequent high-temperature holding differed significantly for specimens subjected to slow and fast deformation. The most notable changes were observed in the structure of specimens deformed at high speeds (10 sec<sup>-1</sup>). They consisted of restructuring of dislocation configurations with the formation of a subgrain structure and subsequent growth of elements of the structure. However,

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SURKOV, Yu. P., et al, Fizika Metallov i Metallovedeniye, Vol 30, No 5, 1970, pp 963-966

the differences in the deformation structure (degree of disorientation, size of fragments) resulting from preliminary high-temperature upsetting were not eliminated during subsequent heating.

Therapy

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USSR

UDC 615.281.8.035.4:616.983.75-053.4-036.8

AKSENOV, V. A., SELIDOVSKIN, D. A., GLADKIKH, G. N., KIRILICH, V. S., KUZNETSOVA, O. V., MOLODISOVA, L. D., BERSENEVA, R. A., AKSENOV, L. A., BOGDANOVA, N. S., and PERSHIN, G. N., All Union Chemico-Pharmaceutical Institute imeni S. Ordzhonikidze, Ministry of Health USSR

"Study of the Prophylactic Value of the New Soviet Antiviral Preparation Oxolin in Preschool Children during the 1969 Influenza Epidemic"

Moscow, Pediatriya, No 5, 1970, pp 18-22'

Abstract: The viricidal agent oxolin (tetraoxotetrahydronaphthalene (dihydrate) is effective in the treatment of adenovirus kerato-conjunctivitis, herpetic keratitis, dermatitides of virus etiology, and some acute respiratory diseases. In a double-blind trial, oxolin was administered to 4,170 children one to seven years of age in an unidentified Soviet city during the 1969 influenza epidemic. (It was applied to the nasal mucosa in the form of a 0.25% ointment on a vaseline base twice daily for 40-49 days). Oxolin reduced the incidence of influenza 1.7 times (43%) compared with control children. Severe forms of the disease and complications were 1.1-1.4 times more frequent in the latter than in those who received the preparation, and the course of the disease was 1.2 days longer on the average. The use of oxolin produced side effects in only 0.6% of the cases.

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Power, Engine, Turbine, Pump

USSR

UDC: 621.433.3-44

OGARKOV, A. G., BERSHACHEVSKIY, V. V., ANTONYUK, I. A., OL'SHEVSKIY, G. P.

"A Fuel Feed Control System"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 8, Mar 73, Author's Certificate No 367279, Division F, filed 5 May 69, published 23 Jan 73, p 98

Translation: This Author's Certificate introduces a fuel feed control system for a free-piston engine operating on a gas-liquid cycle. The system contains a pump for metering liquid fuel and feeding it to the atomizer, a control mechanism, and a gas-feed valve with a regulator for metering the gas entering from the main line. As a distinguishing feature of the patent, the liquid fuel consumption is reduced, and the pickup of the engine is improved by making the regulator in the form of a cylindrical slide valve and sleeve having openings for delivery of gas to the feed valve. The sleeve is movable with respect to the housing and is fitted with tension members with locking devices, one of which is kinematically coupled to the fuel pump rack, while the other is kinematically coupled to the control mechanism. The patent also covers a modi-

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OGARKOV, A. G. et al., USSR Author's Certificate No 367279

fication of this control system distinguished by the fact that the regulator is equipped with a startup gas pressure governor and a power corrector made in the form of a cylinder connected to the gas main with a piston whose rod is kinematically coupled to the regulator slide valve.

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USSR

UDC 62-504.1

BERSHADSKIY, A. M., SAPOZHKOVA, K. A.

"Comparative Analysis of Various Discrete Circuits"

Novocherkassk, IVUZ Elektromekhanika, No 1, Jan 70, pp 19-22

Abstract: A method is considered for comparing the quality of different discrete circuits using coefficients of quality and significance with respect to the following parameters: percent output of usable circuits, economy, reliability and overall dimensions. The quality of the circuits being compared can be checked differentially with respect to each parameter separately, or integrally with respect to all parameters simultaneously. The proposed comparison criteria account for the functional relationships between such parameters of the circuit as logical complexity, cost, speed, size, weight and reliability. These criteria may be used for comparing circuits from the standpoint of the user (equipment designer). The proposed method may be used (as given or with slight modifications) for comparing any identical circuits, elements, systems, subassemblies, modules, etc. provided the objects to be compared are characterized by the same parameters.

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USSR

UDC 621.372.832.43

RESHNIKOV, V. V., SHISHKINSKIY, V. Ye., BERSHADSKIY, G. Sh.

"A Resonance Power Diode for the Decimeter Wavelength Band"

Elektron. tekhnika. Nauch.-tekhn. sb. Tekhnol. i organiz. proiz-va (Electronic Technology. Scientific and Technical Collection. Technology and Organization of Production), 1970, vyp. 8(40), pp 98-99 (from RZh-Radiotekhnika, No 7, Jul 71, Abstract No 7B171)

Translation: The paper describes the construction of a resonance diode for the decimeter wave band, designed for a high SHF power level. The design utilizes a ferrite-magnesium chromite insert, and also an effective system for heat removal from the insert. The diode can dissipate up to 6 kW of power. One illustration. Resumé.

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USSR

UDC 621.316.72.001.5

BERSHADSKIY, I. G., Engineer, and NEYMARK, V. M., Engineer

"Two-Channel Current Stabilizer for Supplying Superconducting Magnetic Systems"

Moscow, Elektrotehnika, No 6, June 1971, pp 16-18

**Abstract:** The authors describe a unit for stabilizing direct current used for supplying superconducting solenoids. The current is stabilized in two different circuits with smooth variation within the 0-150 amps limits and parallel switching of channels from 0-300 amps. Current maintenance stability is better than 0.001% and the variable component for a current load of 150 amps does not exceed 0.02%. The following block-diagrams are given: one channel of the current stabilizer, the regulating element, feedback amplifier, variable supply source, etc. The proposed circuitry can serve for making multichannel and more powerful (1000 amp and higher) stabilizers. Original article: six figures and four bibliographic entries.

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USSR

UDC 621.375.4:621.383

BERSHADSKIY, I. G., PAVLENKO, V. A.

"Highly Stable Autogenerator Photocurrent Amplifier"

Moscow, Izmeritel'naya Tekhnika, No 10, 1971, pp 54-55

Abstract: An amplifier for measuring photometric signals is described. Application of the autogenerator method of amplifying the photocurrent strength permitted an amplifier to be built with invariant metrologic characteristics during continuous operation for more than 500 hours in the temperature range of 10-50° C. A characteristic feature of the developed autogenerator amplifier is the application of a semiconductor integrated 2-cascade amplifier with galvanic couplings as an alternating current amplifier. This has permitted an amplifier with dimensions of 86 × 55 × 30 mm and an intake of 200 milliwatts to be built. Application of the described amplifier greatly facilitates the construction of compact multichannel measurement and control systems.

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1/2 037 UNCLASSIFIED PROCESSING DATE--16OCT70  
TITLE--DYNAMIC EQUILIBRIUM OF PROCESSES INVOLVED IN THE FRICTION AND WEAR  
OF METALS -U-  
AUTHOR--(03)-ARONOV, V.A., KOSTETSKIY, B.I., BERSHADSKIY, L.I.  
COUNTRY OF INFO--USSR  
SOURCE--AKADEMIYA NAUK SSSR, DOKLADY, VOL. 190, FEB. 21, 1970, P.  
1337-1339  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--METAL FRICTION, WEAR RESISTANCE, ELECTRON MICROSCOPY, PLASTIC  
DEFORMATION, DYNAMIC SYSTEM, SURFACE AREA  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1995/1117 STEP NO--UR/0020/70/190/000/1337/1339  
CIRC ACCESSION NO--AT0116583  
UNCLASSIFIED

2/2 037

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AT0116583

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXPERIMENTAL INVESTIGATION IN WHICH THE SURFACE STRUCTURES OF METALS SUBJECTED TO FRICTION AND THEIR PARAMETERS WERE MEASURED WITH THE AID OF ELECTRON MICROSCOPY. THE ELECTROCHEMICAL POTENTIAL OF SURFACES DURING FRICTION, AND THE ELECTROMAGNETIC PARAMETERS OF THE SURFACE LAYERS WERE ALSO MEASURED. RELATIONS ARE OBTAINED WHICH DETERMINE THE NATURE OF OPTIMUM FRICTION AND WEAR PROCESSES. AN ANALYSIS OF THESE RELATIONS SHOWS THAT FOR GIVEN PARAMETERS OF THE MEDIUM AND MATERIAL THERE EXISTS A CERTAIN RANGE OF LOADS AND SLIP VELOCITIES FOR WHICH THE DESTRUCTION PROCESS ARE LOCALIZED IN THIN SURFACE LAYERS OF SECONDARY STRUCTURES (OF THE ORDER OF SEVERAL HUNDRED ANGSTROMS). WITHIN THIS RANGE, THE PROCESSES OF DESTRUCTION AND RESTORATION OF SECONDARY STRUCTURES ARE IN DYNAMIC EQUILIBRIUM; THE FRICTION SURFACES ARE IN A METASTABLE STATE, DUE TO DYNAMIC EQUILIBRIUM; THE PARAMETERS OF THE DYNAMIC EQUILIBRIUM AND METASTABLE STATES ARE DETERMINED BY THE LOADING CONDITIONS; AND THE STRUCTURAL CHANGES DUE TO PLASTIC DEFORMATION ARE LOCALIZED IN THIN SURFACE LAYERS.

UNCLASSIFIED

1/2 032 UNCLASSIFIED PROCESSING DATE--18SEP70  
TITLE--NORMAL FRICTION AND APPEARANCE OF DEFECTS IN MACHINES -U-  
AUTHOR-(02)-KOSTETSKIY, B.I., BERSHADSKIY, L.I. *B*  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, MASHINOVEDENIYE, NR 1, JAN. FEB 70, PP 94-103  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--METAL FRICTION, WEAR RESISTANCE, MACHINERY LUBRICANT, METAL  
SURFACE PROPERTY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1986/1180 STEP NO--UR/0380/70/000/001/0094/0103  
CIRC ACCESSION NO--AP0103086  
UNCLASSIFIED

2/2 032

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NU--AP0103086

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ARTICLE INVESTIGATES THE MECHANISM OF NORMAL FRICTION FOR THE CASE OF NONLUBRICATED SURFACES. HOWEVER THE MOST FAVORABLE CONDITION OF NORMAL FRICTION IS THE PRESENCE OF BOUNDARY LAYER OF LUBRICANT. THE CONDITIONS OF GRAIN ORIENTATION DUE TO DECONCENTRATION OF THE NORMAL LOADING THROUGH A QUASI ELASTIC LAYER OF LUBRICANT AND REDUCTION OF SURFACE ENERGY IN THE PRESENCE OF SURFACE ACTIVE SUBSTANCES ARE IMPROVED. THIS ALLOWS BROADENING OF THE RANGE OF LOADS AND RATE OF SLIP UNDER WHICH THE NORMAL PROCESS OF FRICTION TAKES PLACE. IN ADDITION, THE BOUNDARY LAYER OF LUBRICANT DECREASES THE RATE OF INFLOW OF OXYGEN AND OTHER CHEMICALLY ACTIVE COMPONENTS OF THE ENVIRONMENT INTO THE FRICTION ZONE WHICH IN TURN LEADS TO IMPROVED MECHANICAL CHARACTERISTICS OF SECONDARY STRUCTURES AND MINIMIZATION OF THEIR WEAR. ANALYSIS AND SYSTEMATIZATION OF THE BASIC CONCEPTS AND RESULTS OF EXPERIMENTS FROM THE VIEWPOINT OF SOLID STATE PHYSICS, THERMODYNAMICS AND MINIMAL PRINCIPLES, AND GENERALIZATION OF POSITIVE TESTING PRACTICES AFFORD THE MEANS OF SUBSTANTIATING THE EXISTENCE OF A UNIVERSAL MECHANISM OF NORMAL FRICTION. THE POSSIBILITY OF ESTABLISHING A RANGE OF CONDITIONS OF NORMAL FRICTION AND OF GIVING A QUANTITATIVE DESCRIPTION OF THE PROCESS WITHIN THAT RANGE IS SHOWN.

UNCLASSIFIED

1/2 032 UNCLASSIFIED PROCESSING DATE--18SEP70  
TITLE--NORMAL FRICTION AND APPEARANCE OF DEFECTS IN MACHINES -U-  
AUTHOR--(02)-KOSTETSKIY, B.I., BERSHADSKIY, L.I.  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, MASHINOVEDENIYE, NR 1, JAN. FEB 70, PP 94-103  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--METAL FRICTION, WEAR RESISTANCE, MACHINERY LUBRICANT, METAL  
SURFACE PROPERTY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1986/1180 STEP NO--UR/0380/70/000/001/0094/0103  
CIRC ACCESSION NO--AP0103036  
UNCLASSIFIED



2/2 032

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0103086

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. THE ARTICLE INVESTIGATES THE MECHANISM OF NORMAL FRICTION FOR THE CASE OF NONLUBRICATED SURFACES. HOWEVER THE MOST FAVORABLE CONDITION OF NORMAL FRICTION IS THE PRESENCE OF BOUNDARY LAYER OF LUBRICANT. THE CONDITIONS OF GRAIN ORIENTATION DUE TO DECONCENTRATION OF THE NORMAL LOADING THROUGH A QUASI ELASTIC LAYER OF LUBRICANT AND REDUCTION OF SURFACE ENERGY IN THE PRESENCE OF SURFACE ACTIVE SUBSTANCES ARE IMPROVED. THIS ALLOWS BROADENING OF THE RANGE OF LOADS AND RATE OF SLIP UNDER WHICH THE NORMAL PROCESS OF FRICTION TAKES PLACE. IN ADDITION, THE BOUNDARY LAYER OF LUBRICANT DECREASES THE RATE OF INFLOW OF OXYGEN AND OTHER CHEMICALLY ACTIVE COMPONENTS OF THE ENVIRONMENT INTO THE FRICTION ZONE WHICH IN TURN LEADS TO IMPROVED MECHANICAL CHARACTERISTICS OF SECONDARY STRUCTURES AND MINIMIZATION OF THEIR WEAR. ANALYSIS AND SYSTEMATIZATION OF THE BASIC CONCEPTS AND RESULTS OF EXPERIMENTS FROM THE VIEWPOINT OF SOLID STATE PHYSICS, THERMODYNAMICS AND MINIMAL PRINCIPLES, AND GENERALIZATION OF POSITIVE TESTING PRACTICES AFFORD THE MEANS OF SUBSTENTIATING THE EXISTENCE OF A UNIVERSAL MECHANISM OF NORMAL FRICTION. THE POSSIBILITY OF ESTABLISHING A RANGE OF CONDITIONS OF NORMAL FRICTION AND OF GIVING A QUANTITATIVE DESCRIPTION OF THE PROCESS WITHIN THAT RANGE IS SHOWN.

UNCLASSIFIED

B  
USSR

UDC 539.62:621.891

KOSTETSKIY, B. I., and BERSHADSKIY, L. I., Kiev

"Normal Friction and Appearance of Defects in Machines"

Moscow, Mashinovedeniye, No 1, Jan-Feb 70, pp 94-103

Abstract: The article investigates the mechanism of normal friction for the case of nonlubricated surfaces. However the most favorable condition of normal friction is the presence of boundary layer of lubricant. The conditions of grain-orientation due to deconcentration of the normal loading through a quasi-elastic layer of lubricant and reduction of surface energy in the presence of surface active substances are improved. This allows broadening of the range of loads and rate of slip under which the normal process of friction takes place. In addition, the boundary layer of lubricant decreases the rate of inflow of oxygen and other chemically active components of the environment into the friction zone which in turn leads to improved mechanical characteristics of secondary structures and minimization of their wear. Analysis and systematization of the basic concepts and results of experiments from the viewpoint of solid state physics, thermodynamics and minimal principles, and generalization of positive testing practices afford the means of substantiating the existence of a universal mechanism of normal friction. The possibility of establishing a range of conditions of normal friction and of giving a quantitative description of the process within that range is shown.

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1/2 014 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--SHORT HANDBOOK ON STEAM TURBINE PLANTS -U-  
AUTHOR--SHLYAKHIN, P.N., BERSHADSKIY, M.L.  
COUNTRY OF INFO--USSR  
SOURCE--SHORT HANDBOOK ON STEAM TURBINE PLANTS (KRATKIY SPRAVOCHNIK PO  
PAROTURBINNYM USTANOVKAM) 2ND ED., MOSCOW, ENERGIYA, 1970, 214 PP  
DATE PUBLISHED-----70  
SUBJECT AREAS--ENERGY CONVERSION (NON-PROPULSIVE)  
TOPIC TAGS--STEAM TURBINE, ELECTRIC GENERATOR, VAPOR CONDENSATION,  
THERMOELECTRIC POWER PLANT  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PPQXY REEL/FRA--1987/0025 STEP NO--UR/0000/70/000/000/0001/0214  
CIRC ACCESSION NO--AM0103713  
UNCLASSIFIED

2/2 014

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AM0103713

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TABLE OF CONTENTS: PREFACE TO THE SECOND EDITION 3. INTRODUCTION 4. CHAPTER I STEAM TURBINES 7. II EXPERIMENTAL CHARACTERISTICS OF TURBINES 102. III CONDENSATION DEVICES 105. IV TURBOGENERATORS 150. V DEAERATORS, REGENERATIVE HEATERS, EVAPORATIVE AND STEAM CONVERTING DEVICES 165. VI OIL SUPPLY OF TURBO UNIT 179. VII TURBINE MAINTENANCE. ECONOMIC INDICATORS OF WORK OF TURBINE PLANT AND TURBINE WORKS 192. VIII SOME INFORMATION OF VARIABLE OPERATING CONDITIONS OF TURBINE 200. APPENDIX 205. LITERATURE 211. THE HANDBOOK CONTAINS TECHNICAL DATA ON STEAM TURBINES, ELECTRIC GENERATORS, CONDENSATION DEVICES AND AUXILIARY EQUIPMENT OF STEAM TURBINE PLANTS OF THERMOELECTRIC POWER STATIONS. THE HANDBOOK WAS INTENDED FOR HEAT ENGINEERS, OCCUPIED WITH THE DESIGN AND OPERATION OF TURBINE PLANTS OF THERMOELECTRIC POWER STATIONS, AND FOR STUDENTS OF POWER SPECIALTIES.

UNCLASSIFIED

1/2 025 UNCLASSIFIED PROCESSING DATE--2000V70  
TITLE--REPRODUCTION OF EXPERIMENTAL HEPATITIS IN DOG PUPPIES -U-  
AUTHOR--(05)--KERIMZADE, K.G., ALEKPEROVA, L.I., SHEKHMAN, A.B., KADIMOV,  
SH.R., GELSHCHANSKIY, M.L.  
COUNTRY OF INFO--USSR  
SOURCE--VOPROSY VIRUSOLOGII, 1970, NR 1, PP 88-93  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--HEPATITIS, DOG, ADENOVIRUS, LIVER, LUNG, PANCREAS  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FNAME--1953/1207 STEP NO--UR/0402/70/000/001/0088/0093  
CIRC ACCESSION NO--AP0054105  
UNCLASSIFIED

2/2 025

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0054105

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ADENOVIRUS TYPES 2 AND 5 AND A STRAIN OF B 61D VIRUS PRODUCED IN EXPERIMENTALLY INFECTED 4 DAY OLD DOG PUPPIES AND PUPPIES OF 1 AND ONE HALF TO 2 MONTHS AN INFECTIOUS PROCESS ACCOMPANIED BY BIOCHEMICAL CHANGES AND PATHOMORPHOLOGICAL LESIONS INDICATING INVOLVEMENT OF THE LIVER, LUNGS AND SOME OTHER ORGANS. MORPHOLOGICAL MANIFESTATIONS OF THE INFECTIOUS PROCESS WERE CHARACTERIZED BY SPECIFIC CHANGES IN EPITHELIAL AND MESENCHYMAL ELEMENTS OF THE LUNGS, LIVER, PANCREAS WITH FORMATION OF INTRANUCLEAR INCLUSIONS OF VIRAL NATURE. THE STRAIN OF B 61D VIRUS WAS FOUND TO BE MARKEDLY HEPATOTROPIC. ADENOVIRUS TYPE 5 AFFECTED THE DIGESTIVE ORGANS AND LUNGS ALMOST TO THE SIMILAR DEGREE, WHEREAS ADENOVIRUS TYPE 2 SHOWED MOST MARKED PNEUMOTROPICITY. ADENOVIRUS TYPE 1 HAD POOR BIOLOGICAL ACTIVITY. THE EXISTENCE OF CROSS SUSCEPTIBILITY OF HUMAN BEINGS AND DOGS TO ADENOVIRUSES AND HIGH RATES OF ISOLATION OF THE LATTER FROM PATIENTS WITH INFECTIOUS HEPATITIS DRAW ATTENTION TO ADENOVIRUSES AS A POSSIBLE ETIOLOGICAL FACTOR IN THIS INFECTION.

USSR

UDC: 534.16.8

BERSHADSKIY, YE. YA. and UL'YANOV, G. K.

"Problem of Processing Signals of the Hydroacoustic Frequency Band on Tubular Ultrasonic Waveguides"

Tr. Leningr. in-t aviats. priborostr. (Works of the Leningrad Institute of Aviation Instrument Building), Leningrad, 1972, vyp.76, pp 84-88 (from RZh-32.Metrologiya i Izmeritel'naya Tekhnika, No 6, 1973, Abstract No 5.32.475).

Translation: The authors measure the group delay characteristics of a fundamental flexural ultrasonic wave with a circular symmetry for tubular waveguides. A brass waveguide was used as an example (length 2m, external radius 3mm, internal radius 1.5mm). The group delay time differential at the quasi-linear section was 1.1 milliseconds in the 18kc frequency band with an average frequency of 238kc. The general introduced losses constitute 4 db. A comparison is made with other types of waveguides and it is shown that it is possible to use tubular waveguides for processing signals in the hydroacoustic frequency range. Original article: four illustrations and four bibliographic entries.

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USSR

UDC 51

BERSHCHANSKIY, YA. M.

"An Approach to Solution of the Multiextremal Problem of Resource Allocation"

V sb. Aktual'n. vopr. tekhn. kibernetiki (Urgent Questions in Technical Cybernetics -- Collection of Works), Moscow, "Nauka," 1972, pp 157-163 (from RZh-Matematika, No 3, Mar 73, Abstract No 3V536 from author's abstract)

Translation: The problem of time-optimal resource allocation on a network schedule reduces to minimization of a linear function on a nonconvex set consisting of several intersecting convex polyhedra. A special method is presented for solution of problems of this type.

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USSR

UDC 51

BERSUCHANSKIY, YA. M.

"Application of the Method of Convex Approximation to the Problem of Resource Distribution"

V sb. Metody optimiz. sistem mnogosvyazn. regulir (Methods of Optimizing Multi-connected Control Systems -- collection of works), Moscow, Nauka Press, 1972, pp 85-94 (from RZh-Kibernetika, No 9, Sep 72, Abstract No 9V530)

Translation: The possibility of obtaining a two-way estimate of the complex execution time is presented for the problem of resource distribution in a complex with fixed order of execution of the operations. The general multiextremal problem of selecting the order of the operations is solved by more precise definition of the estimates and subsequent sectioning of the versions.

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1/2 015 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--USE OF CONVERSION GAS FOR REMOVAL OF METHANE HOMOLOGS FROM NATURAL  
GAS BY HYDROGENATION -U-  
AUTHOR--(05)-BEKSHTEYN, A.YA., KHRULEV, V.L., MESHENKO, N.T., KOVALENKO,  
N.A., VESELOV, V.V. **B**  
COUNTRY OF INFO--USSR  
SOURCE--NEFT. GAZOV. PROM. 1970, (1), 45-6  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS, CHEMISTRY  
TOPIC TAGS--METHANE, NATURAL GAS, HYDROGENATION, CARBON MONOXIDE, METAL  
CATALYST, NICKEL  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3005/1967 STEP NO--UR/0513/70/000/001/0045/0046  
CIRC ACCESSION NO--AP0133811  
UNCLASSIFIED

2/2 015

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0133811

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A GAS MIXT. CONTG. 74.6PERCENT H AND 20PERCENT CO, OBTAINED BY CATALYTIC CONVERSION OF NATURAL GAS AT 900DEGREES, WAS USED FOR THE DESTRUCTIVE HYDROGENATION OF CH SUB4 HOMOLOGS IN NATURAL GAS. A MIXT. OF 1 PART OF THE GAS MIXT. AND 3.5-5.6 PARTS NATURAL GAS WAS PASSED OVER A REDUCED NI CATALYST AT 300DEGREES.

UNCLASSIFIED

USSR

UDC: 51:621.391

MELIKHOV, A. N., BERSHETYN, L. S., KARELIN, V. P.

"On Isomorphic Embedding of Graphs and Abstract Automata"

Tr. Seminara po metodam mat. modelir. i teorii elektr. tsepey. In-t kibernet.  
AN USSR (Works of the Seminar on Methods of Mathematical Modeling and Electric  
Circuit Theory. Institute of Cybernetics, Academy of Sciences of the UkrSSR),  
1970, vyp. 7, pp 95-104 (from RZh-Kibernetika, No 1, Jan 71, Abstract No 1V334)

Translation: Algorithms are described for recognition of isomorphic embedding  
of graphs and abstract automata. In the authors' opinion, these algorithms  
are suitable for realization on digital computers. Some properties of iso-  
morphic embeddings of graphs and automata are established.

Radiobiology

USSR

UDC 577.391

BERNSHTEYN, V. A.

"Radiosensitivity Under Conditions of Hypothermia"

Moscow, Meditsinskaya Radiologiya, No 10, 1971, pp 80-90

Abstract: A survey of the Soviet and foreign literature on the radiosensitivity of normal tissues and tumors after irradiation under conditions of hypothermia indicates that hypothermia generally has a protective effect on the tissues. In the case of normal tissues, much depends on the depth of hypothermia and the tissues used as a criterion of radiosensitivity. Whether or not cold has a direct effect on tumors remains debatable. One table summarizes the results of experimental studies on normal tissues in mice, rats, rabbits, and dogs using various criteria of radiosensitivity (e.g., survival, mitotic index, number of chromosomal aberrations, leukocyte count, weight of spleen, hemoglobin concentration, weight of testes, and so forth). Another table presents the results of irradiating tumors in rats and mice and in humans.

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USSR

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UDC:

BERSHTEYN, V. A. and SHALREY, L. M., Physico-Technical Institute imeni A. F. Ioffe, USSR Academy of Sciences, Leningrad (Fiziko-technicheskiy institut imeni A. F. Ioffe AN SSSR, Leningrad)

"Nature of an Ambient Medium and Destruction of High-Strength Glass"

Leningrad, Fizika Tverdogo Tela, Vol 12, No 1, January 1970, pp 196-202

Abstract: The authors experimentally study the role of a medium in the destruction of high-strength glass. Glass strength is studied in vapors of various materials with differing structures and molecular properties (the effect of moisture was excluded). Strength-time relationships are determined for quartz and alkali containing types of glass in water and in aqueous solutions with increased surface activity or chemical aggressiveness. The results show that the strong weakening effect which moisture has on stressed glass cannot be explained solely on the basis of its decreased surface energy. Physical adsorption of various substances on the surface of glass does not significantly affect its strength, including those substances with higher molecular polarity and which form a stronger hydrogen bond with glass than does water. A conclusion is made about the determining role played by the chemical reaction of water (or aqueous solution) with glass. This reaction is accelerated by tensile stress. The effect of moisture is practically the same for the types of glass tested irrespective of the degree of imperfection.

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Acc. Nr:

AP0019927

Abstracting Service:

CHEMICAL ABST.

Ref. Code:

5/70 UR0181

BERSHTEYN V.A.

929046 Nature of the surrounding medium and the destruction of high-strength glass. Bershtein, V. A.; Shamrei, I. M. (Fiz.-Tekh. Inst. im. Ioffe, Leningrad, USSR). *Fiz. Tverd. Tela* 1970, 12(1), 196-203 (Russ). Exptl. investigation was carried out of the role of medium in the decompn. of high-strength glass. The glass strength was studied in vapors of various substances which differ by their structures and mol. properties (in the absence of the effect of humidity). Time dependences were obtained of the strength of quartz and alkali-contg. glasses in water and aq. solns. with increased surface activity or chem. aggressiveness. A strong decomp. action of moisture on stressed glass cannot be explained only by a decrease in its surface energy. Phys. absorption of various substances on the glass surface including those with a higher polarity of their mols. and forming with glasses a stronger H-bonding than water, has no effect on its strength. The detg. role is played by the chem. reaction of humidity with glasses accelerated by stretching tension. The effect of humidity is essentially the same for glasses with different amts. of defects.

A. Libackyj

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REEL/FRA  
19801863

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1/2 023 UNCLASSIFIED PROCESSING DATE--16OCT70  
TITLE--USE OF INFRARED SPECTRA OF MULTIPLY PERTURBED TOTAL INTERNAL  
REFLECTION TO STUDY GLASS SURFACES -U-  
AUTHOR-(02)-BERSHTEYN, V.A., NIKITIN, V.V. **B**  
COUNTRY OF INFO--USSR  
SOURCE--DOKL. AKAD. NAUK SSSR 1970, 190(4), 823-6 (TECH PHYS)  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--IR SPECTRUM, PLASTIC FILM, POLYSTYRENE RESIN, GLASS SURFACE  
PROPERTY, SPECTRUM/(U)MPTIR INTERNAL REFLECTION SPECTRA  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1995/1580 STEP NO--UR/0020/70/190/004/0823/0826  
CIRC ACCESSION NO--AT0116988

UNCLASSIFIED



2/2 023

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AT0116988

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN IR. SPECTROSCOPIC METHOD IS DEVELOPED FOR A QUANT. STUDY OF THE SURFACE OF A GLASS BY USING THE GLASS SIMULTANEOUSLY AS A PRISM AND AS THE SAMPLE FOR SURFACE STUDY. THE METHOD INVOLVES THE TECHNIQUE OF MULTIPLY PERTURBED TOTAL INTERNAL REFLECTION (MP TIR). THE METHOD CAN BE USED FOR STUDY OF FINE ORG. FILMS. THE MPTIR SPECTRA OF A FINE POLYSTYRENE FILM ON A GLASS IS SUPER IMPOSABLE (SHIFT SMALLER THAN OR EQUAL TO 5 CM PRIME NEGATIVE1) WITH IR ABSORPTION SPECTRA OF POLYSTYRENE. FACILITY: FIZ.-TEKHN. INST. IM. IOFFE, LENINGRAD, USSR.

USSR

UDC 538.3 : 530.145

BERSON, I. YA., Institute of Physics, Academy of Sciences Latvian SSR

"Electron in a Quantized Field of a Plane Electromagnetic Wave"

Riga, Izvestiya Akademii Nauk Latviyskoy SSR, Seriya Fizicheskikh i  
Tekhnicheskikh Nauk, No 3, 1970, pp 3-8

Abstract: In a previous article the author solved the problem of the motion of an electron in a quantized field of a monochromatic electromagnetic wave. The present article gives a generalization of this solution for the case of an arbitrary plane electromagnetic wave. A solution is found for a modified Dirac equation as well as for an equation for coupled harmonic oscillators. There is a discussion of the addition to electron mass resulting from the interaction of the electron with the electromagnetic field of the plane wave.

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USSR

UDC 621.374.34:621.395.664.3

BACKIN, R.F., BERSON, M.M.

"Resonant Power Limiter Based On Semiconductor Diodes"

V sb. Materialy nauch.-tekhn. konf. Leningr. elektrotekhn. in-ta svyazi. Vyp.4  
(Materials Of A Scientific-Technical Conference Of The Leningrad Electrical  
Engineering Institute Of Communications. No. 4--Collection Of Works), Leningrad,  
1971, pp 121-125 (from RZh:Radiotekhnika, No 2, Feb 72, Abstract No 2D47)

Translation: Problems are considered of the calculations for a diode power  
limiter operating in a 2-resonance regime. Formulas are presented for calc-  
ulation of the elements of the limiter, with various circuits for inclusion  
of supplementary capacitance. The model developed has losses  $< 1$  db and in-  
troduces a maximum attenuation of more than 25 db in a 20-percent frequency  
band. Summary.

1/1

USSR

UDC 621.317.335.3

BERSON, M. M. **B**

"Method of Measuring the Dielectric Constant of Dielectrics at Superhigh Frequency"

Materialy nauchno-tekhn. konferentsii. Leningr. elektrotekhn. in-t svyazi  
(Materials of the Scientific and Technical Conference. Leningrad Electro-  
technical Communications Institute. Vyp. 4), 1970, pp 97-99 (from RZh-  
Radiotekhnika, No 9, Sep 70, Abstract No 9A154)

Translation: A method of measuring the dielectric constant of dielectrics with small losses by means of standard measuring equipment has been proposed. The necessary calculation relations and a block diagram of the measuring device are presented.

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USSR

UDC 681.332.65

BERSON, Yu. Ya.

"Single-Cycle Shift Register"

USSR Author's Certificate No 265943, filed 4 Oct 68, published 2 Jul 70  
(from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 6,  
Jun 71, Abstract No 6 B196 P)

Translation: The necessity for two sources of cycle pulses shifted with respect to time and reduced noise resistance of the closed registers are deficiencies of shift registers (dividers) executed as two-cycle ferrite transistor cell registers. In addition, the schematic of the dividers in two-cycle shift registers requires more equipment. Similar systems using single-cycle shift registers are less reliable and have lower speed. The purpose of this invention is simplification of the ferrite transistor cell shift register circuit and improvement of its reliability and speed. This is achieved by the fact that in the proposed single-cycle register made of ferrite-transistor cells the time sharing of writing and reading "1" in the cores is not realized as a result of the processes of charging and discharging capacitors in four-terminal coupling networks, as in well-known single-cycle registers, but as a result of using the cell transistors as

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USSR

BERSON, Yu. Ya., USSR Author's Certificate No 265943, filed 4 Oct 68, published 2 Jul 70 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 6, Jun 71, Abstract No 6 B196 P)

current switches and automatic interruption of the cycle pulses when reading a "1" from any of the cells. There is 1 illustration.

2/2

USSR

UDC: 621.317.738

~~BERSUDSKIY, A. A.~~

"On the Problem of Designing Digital Instruments for Measuring the Basic Parameters of Inductance Coils With Magnetically Soft Ferrite Cores"

Dokl. Vses. nauchno-tekhn. konferentsii po radiotekhn. izmereniyam. T. 1 (Reports of the All-Union Scientific and Technical Conference on Radio Engineering Measurements. Vol. 1), Novosibirsk, 1970, pp 17-18 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12A360)

Translation: It is noted that low-frequency digital instruments for measuring the parameters of inductance coils with soft ferrite cores should be based on a rectangular-coordinate AC circuit with a phase-sensitive voltage comparator as the balance indicator. A measurement installation based on this principle is described. One illustration. N. S.

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USSR

UDC 621.791.1:621.574

KHRENOV, K. K., BALAKIN, V. I., MNISHENKO, I. A., and SERGEYEVA, YU. A., Institute of Electric Welding imeni Ye. O. Paton, Academy of Sciences Ukrainian SSR; BERSUDSKIY, S. YU., and CHERNYAK, G. I., Minsk Plant of Refrigeration Units

"Cold Welding of Copper and Aluminum Tubing"

Kiev, Avtomaticheskaya Svarka, No 11, Nov 70, pp 49-50

Abstract: A new welding technology is described for aluminum and copper tubing. For aligning the mechanical properties of both aluminum and copper tubing, the latter was annealed at 600 to 800° C for 20-30 minutes up to the point of removing the work hardening. A microstructural examination of the joints performed by cold welding failed to reveal any flaws. Copper appears to preserve its coarse-grained structure (acquired after annealing) almost up to the very line of the copper-aluminum interface. The grains were slightly stretched in the direction of the metal flow. Specimens of pipes welded by the new method were mounted in two refrigeration units and subjected to laboratory tests for prolonged vibration and transportability. The continuous action of vibration damaged the condensers but failed to affect the strength of the welded joints.

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1/2 018 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--POLARIZATION OF BANDS IN THE OPTICAL SPECTRA OF TRANSITION METAL  
COMPLEXES WITH ACCOUNTING FOR THE JAHN TELLER EFFECT -U-  
AUTHOR-(04)-TSUKERBLAT, B.S., VEKHTER, B.G., BERSUKER, I.B., ABLOV, A.V.  
COUNTRY OF INFO--USSR  
SOURCE--ZH. STRUKT. KHIM. 1970, 11(1), 102-7  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--LUMINESCENCE SPECTRUM, EXCITED STATE, TRANSITION METAL,  
COMPLEX COMPOUND  
CCNTRCL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--2000/1658 STEP NO--UR/0192/70/011/001/0102/0107  
CIRC ACCESSION NO--AP0125280  
UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0125280

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE THEORY OF POLARIZED LUMINESCENCE SPECTRA FOR COMPLEXES OF  $D_{4h}$  (TETRAGONAL) AND  $D_{3d}$  (TRIGONAL) SYMMETRY IS CONSIDERED. FOR TRANSITIONS FROM A NON DEGENERATE STATE TO A DEGENERATE STATE IF LIGHT IS POLARIZED ALONG (100), POLARIZED LUMINESCENCE IS OBSD., BUT IF LIGHT IS POLARIZED ALONG (111), LUMINESCENCE IS COMPLETELY DEPOLARIZED AND THE EXCITED STATE HAS TETRAGONAL MIN. IF FOR LIGHT POLARIZED ALONG (111) LUMINESCENCE IS PARTIALLY POLARIZED, BUT FOR LIGHT POLARIZED ALONG (100) LUMINESCENCE IS COMPLETELY DEPOLARIZED, THE EXCITED STATE HAS TRIGONAL MIN. FOR TRANSITIONS BETWEEN DEGENERATE STATES, THE PRESENCE OF 2 BANDS REPRESENTING MAGNETIC DIPOLE TRANSITIONS BETWEEN THE DEGENERATE STATES PROVES THE EXISTENCE OF TRIGONAL MIN. IN BOTH STATES. IN THE PRESENCE OF 1 BAND, LIGHT POLARIZED PARALLEL TO (100) WITH LUMINESCENCE PARTIALLY POLARIZED IN THE SAME DIRECTION IMPLIES TETRAGONAL MIN., WHILE COMPLETELY DEPOLARIZED LUMINESCENCE IMPLIES TETRAGONAL AND TRIGONAL MIN. THESE RESULTS HOLD ONLY IN THE ADIABATIC APPROX. AND NEGLECT TUNNELLING BETWEEN EQUIV. CONFIGURATIONS. IF TUNNELLING OCCURS, THE LUMINESCENCE IS DEPOLARIZED. FACILITY: INST. KHIM., KISHINEV, USSR.

UNCLASSIFIED

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UDC 541.12:542.61:541.6:547.1'118

KABACHNIK, M. I., LASKORIN, B. N., BERTINA, I. E., MEDVED', T. YA., KOSSYKH, V. G., YUDIN, K. S., BERKMAN, Z. A., and NEPRYAKHIN, A. M., Institute of Hetero-Organic Compounds, USSR Academy of Sciences

"Dependence of the Extraction Ability of the Dioxides of Tetraarylmethylene Diphosphines Upon Their Structure"

Moscow, Izvestiya Akad. Nauk SSSR, Seriya Khimicheskaya, No 1, Jan 72, pp 65-70

Abstract: The connection between extraction ability and structure is currently being widely studied, but so far only in the case of monodentate neutral organophosphorus compounds; the corresponding bidentate compounds, with two phosphoryl groups in the molecule, have gone completely unstudied.

Using the extractant dilution method, the authors determined the composition of the extracting complexes of uranyl nitrate with dioxides of the tetraarylmethylene diphosphines containing various substitutes in the meta- and para-positions of the phenyl rings. Effective extraction constants of uranyl nitrate for a series of tetra-substituted dioxides of the methylene-diphosphines were computed. Effective extraction constants for complexes with three molecules of the extractant were found to correlate well with the Hammett constant, and with the  $\sigma^f$  constant -- something not observed in the case of 1/2

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KABACHNIK, M. I., et al., Izvestiya Akad. Nauk SSSR, Seriya Khimicheskaya,  
No 1, Jan 72, pp 65-70

complexes with two molecules of the dioxide. Finally, the connection between the extraction ability of the diphosphines and their alkalinity was found to be a linear one. Various tables and graphs are included in the paper.

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USSR

UDC [621.3.011.2.017.2:621.3.044.3+536.485]001.24

BERTINOV, A. I., ALIYEVSKIY, B. I., SHERSTYUK, A. G., ORLOV, V. L., and  
ALABIN, G. P.

"Electrical Losses and Resistance of Cryogenic Inductors Allowing for the  
Magnetoresistance Effect"

Moscow, Izvestiya Akademii Nauk SSSR, Energetika i Transport, No 6, 1972,  
pp 72-77

Abstract: Powerful magnetic-field inductors based on superconductors of very pure metals at cryogenic temperatures are being used in electrical engineering and physics equipment and considered for use in electric power transmission lines. The authors present a graphical analytic procedure for determining the electrical losses  $P$  and resistance  $R$  of aluminum, beryllium, and copper circular inductor coils of rectangular cross section, allowing for the magnetoresistance effect caused by the transverse plane-meridional coil field. Experimental values of the resistivities as a function of the transverse magnetic field induction at low constant temperatures are used to calculate approximating polynomial functions. The procedure involves 1) selecting coil material coefficients from a table (or precalculating them) in accordance with the operating temperature, 2) finding other coefficients from a family of curves  
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BERTINOV, A. I., et al., Izvestiya Akademii Nauk SSSR, Energetika i Transport, No 6, 1972, pp 72-77

based on the coil cross-section outer radius and width, and 3) calculating  $P$  and  $R$  as a function of the geometrical inductor dimensions, number of turns  $w$ , current density, space factor  $k_z$ , and above coefficients. A Mayri-2 electronic computer was used in the calculations. The method is illustrated by a cryogenic aluminum-wire solenoid having 1.1 cm and 3.56 cm inner and outer cross section radii, 4 cm width,  $w = 124$ , and  $k_z$  approximately 0.37. A cryostat with liquid helium at a temperature  $T = 4.2^\circ \text{K}$  was utilized for the experiments. The authors attribute some difference in the calculated and observed data to unstable magnetoresistance over the winding length. The effect of the intrinsic magnetic field with a 350 A current produces nearly a 6-fold increase in the coil  $R$  and  $P$ . A simplified peak estimate of the magnetoresistance based on a maximum solenoid induction of about  $0.96 \cdot T$  yields a 1.5 fold increase in the resistance by comparison with the actual values. The authors recommend this procedure for engineering use when designing cryogenic inductors.

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UDC: [621.313.32:537.312.62]001.24

BERTINOV, A. I., MIRONOV, O. M., Moscow

"Selecting the Principal Dimensions of a Synchronous Generator With Superconducting Magneto"

Moscow, Izv. AN SSSR: Energetika i Transport, No 4, Jul/Aug 72, pp 29-38

Abstract: A principal design equation is derived for a synchronous machine in which account is taken of the limiting critical relation between current density and magnetic field for the superconducting material of the field winding. A criterion is proposed for determining the principal characteristics of the generator. It is found that the leakage coefficient of the magnetic circuit in a synchronous generator with superconductive field winding assuming maximum power per unit volume of the magneto is about 0.60-0.75. An increase in the relative inside diameter of the magneto increases the outside diameter of the field winding and reduces the space taken up by the superconductor. Engineering methods are proposed for calculating the dimensions of the armature to give the required leakage coefficient of the magnetic circuit and relative inductive reactance of the armature winding.

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USSR

UDC: [621.313.32.011.23:536.483]001.24

BERTINOV, A. I., MIRONOV, G. M., GOLOVKIN, A. V., Moscow

"Inductive Reactances of a Cryogenic Synchronous Machine With Ferromagnetic Shield"

Moscow, Izv. AN SSSR: Energetika i Transport, No 4, Jul/Aug 72, pp 61-65

Abstract: The principal inductive reactances of the straight sections of windings are determined in a synchronous machine with cryogenic cooling of the windings and with a magnetic-circuit shield. Engineering methods for calculating the inductive reactances are presented. The results of the studies are compared with the parameters of similar machines without a shield. It is found that a ferromagnetic shield over the windings of the generator increases the emf by a factor of 1.4-1.9 over machines without shielding. The ferromagnetic shield has practically no effect on the inductive reactances of differential scattering.

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UDC: [621.313.32.011.3/045.7:536.483]001.24

BERTINOV, A. I., MIRONOV, O. M., MOKIN, V. S., Moscow

"Coefficients of Induction of a Cryogenic Synchronous Machine With Damper System"

Moscow, Izv. AN SSSR: Energetika i Transport, No 4, Jul/Aug 72, pp 56-60

Abstract: The self-inductance of a damper system in a cryogenic synchronous machine without magnetic circuit is calculated. The mutual coefficients of the induction of damper and coils are determined and curves are presented for the mutual inductances as functions of the relative geometric dimensions of the machine. It is found that the self-inductance of the damper and its mutual inductance with the coils are independent of the absolute values of machine diameters. As the thickness of a winding increases, its mutual inductance with the damper decreases. As the number of poles of the machine is increased, the self-inductance of the damper increases and its mutual inductance with the windings decreases. With a variation in the ratio of outside to inside diameter of the damper wall between 1 and 1.1, its self-inductance varies little, and can therefore be taken as constant in designing two-pole and four-pole machines.

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REEL # 3  
BALIN, P.N. to  
BERTINOV, A.I.